

## Storm Surge PFHA – EPRI Report

John Weglian, Senior Technical Leader, EPRI

Jemie Dababneh, Senior Director, RIZZO

It is important to evaluate risks to nuclear power plants and other vital structures from external hazards that could potentially simultaneously impact multiple, diverse equipment relied upon for accident mitigation. External flooding sources can overwhelm a site's response when the flood levels exceed the plant's design basis. A Probabilistic Flood Hazard Assessment (PFHA) provides a mechanism to quantify the risk to a site from an external flooding hazard, including from extremely rare beyond design basis events. One of the external flooding hazards that can impact a site is a storm surge – the elevation in water level at the shore due to the atmospheric effects of a large storm.

This presentation describes an EPRI report which documents methods for performing a Probabilistic Storm Surge Hazard Assessment (PSSHA). Many storm surge methods and analyses are focused on assessing the flooding impacts from a tropical storm making landfall; however, other types of storms can cause storm surges, and these events can occur on large lakes as well as oceans. The EPRI report describes multiple methods for performing a PSSHA; however, a detailed example provided is based on assessing a storm surge for an inland lake site using historical water and wave heights.

The process of performing a PSSHA begins with identification that a site is potentially subject to a storm surge. The PSSHA then utilizes a qualitative or quantitative screening approach to determine if the hazard can be screened out from further consideration. If the hazard cannot be screened, a probabilistic approach is used to determine the frequency of the storm surge flooding parameters (e.g. water level). At each step in the process, the uncertainty in the analysis is considered and characterized. The PSSHA process includes the use of a peer review to provide an independent assessment of the process and decisions made in the analysis.